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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,163	03/14/2001	Masaru Osada	0378-0381P	1759

2292 7590 07/14/2005

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EXAMINER

YODER III, CHRISS S

ART UNIT	PAPER NUMBER
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2612

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/805,163

Applicant(s)

OSADA ET AL.

Examiner

Chriss S. Yoder, III

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-83 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 8 is/are rejected.
- 7) ☒ Claim(s) 13, 18, 23, 28, 33, 38, 43, 48, 53, 58, 63 and 68 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 03/07/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims withdrawn from consideration are 4-7,9-12,14-17,19-22,24-27,29-32,34-37,39-42,44-47,49-52,54-57,59-62,64-67 and 69-83.

DETAILED ACTION

Election/Restrictions

Applicant's election of 1-3, 8, 13, 18, 23, 28, 33, 38, 43, 48, 53, 58, 63, and 68 in the reply filed on March 7, 2005 is acknowledged.

Applicant elected species 17 with traverse, based on the generic claim 1. The examiner agrees that claim 1 is a generic claim and that upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Claim Objections

Claim 8 is objected to because of the following informalities:

Claim 8 recites the limitation "read out signal charges of a same *filed* while mixing pixels", in lines 3-4. However, the examiner believes this limitation should read "read out signal charges of a same *field* while mixing pixels." Therefore, claim 8 will be examined as understood by the examiner at the time of examination.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya (US Patent # 6,366,694) in view of Higuchi (US Patent # 6,271,005).

2. In regard to claim 1, note Acharya discloses the use of an image pickup section comprising color filter comprising color filter segments for separating light incident via the apertures into a plurality of colors each having a particular spectral characteristic, wherein said color filter segments include color filter segments having complementary color spectral characteristics (column 4, lines 10-15; each pixel is specific color based on the filter), an image sensing section comprising photosensitive cells for converting the light transmitted through said color filter segments electric signals, wherein nearby ones of said photosensitive cells are shifted from each other in at least one of a vertical and a horizontal direction in a bidimensional arrangement (column 4, lines 10-15; the pixels are arranged in a horizontal and vertical array pattern, and each pixel outputs an image signal value), an operation commanding circuit for outputting a timing and any one of a plurality of modes for reading the signals out of said image pickup section (column 4, lines 45-50), a digitizing circuit for converting the signals read out of said image pickup section to digital data (column 3, lines 30-37; although it is not explicitly disclosed that the signal read out is digitized, this step is inherent based on the use of a digital camera), wherein said digital data are arranged in a plane that contains said photosensitive cells and virtual pixels derived from a shifted arrangement of said photosensitive cells (column 4, lines 20-40; the 8-bit pattern shown in fig. 1a is considered the photosensitive cells, and the 24-bit pattern is considered to be the virtual

pixels), and a signal processing circuit for interpolating, in a first mode designated by said operation commanding circuit, pixel data positions of said photosensitive cells and generating three primary color data on the basis of a plurality of pixel data, which are produced by mixing pixel data (column 4, lines 20-40; the 8-bit pattern shown in fig. 1a is considered the photosensitive cells, and the 24-bit pattern is considered to be the virtual pixels). Therefore, it can be seen that the Acharya device lacks the use of electrodes arranged in such a manner as to skirt round the apertures for producing signals from said photosensitive cells and transfer registers each for sequentially transferring the signals input via said electrodes in a vertical direction or a horizontal direction. Higuchi discloses the use of electrodes arranged in such a manner as to skirt round the apertures for producing signals from said photosensitive cells (figure 1:16; and column 3, lines 55-65) and transfer registers each for sequentially transferring the signals input via said electrodes in a vertical direction or a horizontal direction (figure 1: 13; column 4, lines 9-11). Higuchi teaches that the use of electrodes arranged in such a manner as to skirt round the apertures for producing signals from said photosensitive cells and transfer registers each for sequentially transferring the signals input via said electrodes in a vertical direction or a horizontal direction is preferred in order to upgrade the sensitivity and degree of integration (column 4, lines 45-46). Therefore, it would have been obvious to one of ordinary skill in the art to modify the Acharya device to include the use of electrodes arranged in such a manner as to skirt round the apertures for producing signals from said photosensitive cells and transfer registers each for

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sequentially transferring the signals input via said electrodes in a vertical direction or a horizontal direction as suggested by Higuchi.

3. Claims 2-3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya (US Patent # 6,366,694) in view of Higuchi (US Patent # 6,271,005) and further in view of Nishizawa et al. (US Patent # 4,516,154).

4. In regard to claim 2, note Acharya discloses that the apertures have a tetragonal or a polygonal shape (figure 1; each pixel is square/rectangular). Therefore, it can be seen that the primary reference of Acharya in view of Higuchi fails to disclose that the apertures are arranged bidimensionally by being shifted from each other by one-half of the pixel pitch in the vertical direction column by column or in the horizontal direction row by row. Nishizawa discloses the use of apertures which are arranged bidimensionally by being shifted from each other by one-half of the pixel pitch in the vertical direction column by column or in the horizontal direction row by row (figure 2). Nishizawa teaches that the use of apertures which are arranged bidimensionally by being shifted from each other by one-half of the pixel pitch in the vertical direction column by column or in the horizontal direction row by row is preferred in order to suppress the generation of Moiré and high quality pictures can be reproduced (column 4, lines 11-12). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the use of apertures which are arranged bidimensionally by being shifted from each other by one-half of the pixel pitch in the vertical direction column by column or in the horizontal direction row by row as suggested by Nishizawa.

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5. In regard to claim 3, note Nishizawa discloses that the color filter segments use a plurality of colors selected from cyan (Cy), magenta (Mg), yellow (Ye) , white (W) and green (G) derived from subtractive mixture (column 2, lines 62-67), wherein a first color is arranged in a tetragonal lattice pattern with the nearby photosensitive cells being shifted from each other by one-half of the pixel pitch, and wherein a second and a third color are arranged in either one of a checker pattern and a full-checker pattern while being shifted from said tetragonal lattice pattern by one-half of the pixel pitch (figure 2).

6. In regard to claim 8, note Nishizawa discloses the use of that the image pickup section performs, in the first mode, interlace scanning to thereby read out signal charges of a same field while mixing pixels or sequentially reads out, in the second mode, all signal pixels (column 3, lines 48-52).

Allowable Subject Matter

Claims 13, 18, 23, 28, 33, 38, 43, 48, 53, 58, 63, and 68 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As for claims 13, the prior art does not teach or fairly suggest the use of an image processing circuit that interpolates an image and raises a frequency band of the pixel data output from the interpolation, then generates luminance and chrominance signals, and removes the aliasing distortion.

As for claims 48, the prior art does not teach or fairly suggest the use of an image processing circuit that interpolates an image signal and the use of a broadband

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circuit, that by using a quasi-frequency adding circuit, that band-by-band adds a component signal, giving priority to color resolution, and preventing overlap in bands.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US006046772A: note the use of interpolation on an image signal.

US006882364B1: note the use of a pixel array with photocells and virtual pixels and the use of image interpolation.

US006847397B1: note the use of a pixel array with photocells and virtual pixels and the use of image interpolation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chriss S. Yoder, III whose telephone number is (571) 272-7323. The examiner can normally be reached on M-F: 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on (571) 272-7308. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CSY
July 8, 2005


THANH TRAN
PRIMARY EXAMINER